

Northwest RFC (originally known as the Portland RFC)



Staff photo from the 1950s, from left to right:
back row: David J. Bauman, Vail P. Schermerhorn, John C. Capell, Donald W. Kuehl, and Robert W. Hullinger
front row: Jay R. Heller, Bertha P. Johnson, and Anthony J. Polos

The Early Years

The early years as recalled by **David J. Bauman**: The impetus for creating the Portland RFC was the second largest flood of record, the 1948 Memorial Day/Vanport flood on the Columbia River at Vancouver, Washington. In December 1949 Mr. Donald W. Kuehl, WWII weather forecaster and civil engineer, assigned to Seattle's Western Region headquarters, was sent to Portland as the first person on site at the newly formed RFC. The RFC was co-located with the North Pacific Division, Corps of Engineers in the U.S. Customs House in Westside downtown Portland. In early 1950, HIC Anthony J. Polos arrived from Ft. Worth, Texas and others on staff in the early years were Vail P. Schermerhorn, Deputy HIC, Robert Hullinger who had worked with the COE snow hydrology research project in Montana as HydroTech, Keith Butson, Climatologist/Statistician, Terri Foster, meteorologist, Roe Heller, hydrologist (also from COE snow hydrology research project), David J. Bauman, meteorologist came in May 1951 and Mrs. Bertha Johnston, secretary. Later Lynn Willoughby, meteorologist for Irving P. Krick Co. and Charles Patterson, meteorologist joined the team. Mr. Elmer Fisher was the longtime Portland River District Supervisor assigned to the Portland (PDX) WSO, also located in the Custom House at that time. Work in the early years was devoted to developing empirical river forecasting and water supply forecasting procedures for the Columbia River basin and its tributaries. Oh, those old calculators, running

multiple regression coefficients by the hour. The Portland RFC area of forecast responsibility was about 320,000 square miles comprised of the states of Washington, Oregon, Idaho, Western Montana and a chunk of British Columbia, Canada. This also included all Pacific Ocean coastal streams from Canada to the California border.

The early years as recalled by **Donald W. Kuehl**: The Portland Oregon River Forecast Center was formed at the particular time due to the disastrous 1948 floods; which were the highest stages at Portland and Vancouver since the 1894 spring flood. New personnel started arriving in December 1949 including Tony Polos, Vail Schermerhorn, Don Kuehl, and Bob Hullinger. Charlie Hopkins I believe transferred from the Portland Weather Bureau Staff. Of this crew only Tony, Vail and Charlie had any operational experience in hydrology. Vail brought a wealth of experience in river forecasting from Kansas City and Tony added his experience from Atlanta Hydrologic engineer position. Elmer Fischer, who was in charge of the Portland River District assisted greatly in introducing we strangers to the Pacific Northwest's great Columbia drainage; and provided some elementary stage relations he had been using to predict the Portland high water. Administratively there was quite a period of time before the MIC was convinced that he was not going to control the river center or the employees. He had suggested those of us who were meteorologists might occasionally fill a night shift at the WX station. In his quiet way Tony finally established the River Center as a distinct, independent unit under the Office of Hydrology and the Regional Office at Salt Lake City. Procedure development preceded slowly beginning with stage and flow relationships on the main stem and larger tributaries. The initial watershed procedures were similar to the three and four quadrant procedures Vail brought from Kansas City. Progress in rainfall-runoff procedure development was slow. Fortunately in PDX RFC area there are two seasons of intense activity: winter rainfall runoff on the coast streams in spring, and summer snowmelt runoff east of the Cascades. Because of the concentration of the population west of the Cascades the development of rainfall runoff in that area was given highest priority.

Early in 1949 or 1950 the Portland WBO moved back out to the airport location from which they had been flooded by the 1948 spring high water. I always thought it was rather embarrassing to have the flood-forecasting agency forced out their digs by a flood.

Their location in the Customs House was taken over by the Corps of Engineers Pacific Division office, with the Water Control Branch directly adjacent to the RFC, with only a walkway and a large bookcase separating us. Tony, friendly person that he was, soon made friends of the Water Control Branch Chief Mark Nelson. The Corps obtained an IBM 650 computer in 1955 under the control of Mark Nelson. Initially they ran only two active programs: payroll and highway cut and fill. So the machine was running idle much of the time. Mark wanted 'his' computer to be used; so he told Tony we could use the computer all we wanted

to and offered us programming assistance. Our very first application soon followed -- Water Supply Forecast computations. At first the Corps had IBM Corporation program their streamflow applications but soon Ed Davis, the IBM programmer, was hired by the Division Office to work with Dave Rockwood to program what ultimately became the Stream Flow Synthesis and Reservoir Regulation model (SSARR). But by about 1963 the model was awaiting watershed forecasting capability; for which Mark and Tony agreed the RFC would provide programming specifications. The RFC (read that Vail) devised the procedures and Ed Davis of the Corps did the programming. Vail put aside the four quadrant procedures and devised more rigorous simulations of the rainfall-runoff processes. Ed programmed the computations according to Vail's specification. So the model became a combined product of the Weather Bureau and the Corps of Engineers. The Corps provided the program maintenance and card punching. The Corps messengers picked up the data sheets from the RFC and delivered to the computer center and returned the final output to the RFC. The printout contained tabular output and graphic plots of each watershed point and streamflow station. From that point on there began a rapid conversion from the existing graphical procedures to the computer computation. Calibration for the smaller streams was added to the model as the need for forecasts were demonstrated. Ed programmed the model to work with either English or Metric units. This was very handy when in 1967 the SSARR model was installed in Bangkok, Thailand for forecasting of the flows and stages of the entire Mekong River from the Chinese border to the South China Sea. In 1969 Don, as a Weather Bureau employee, traveled to Bangkok for the first of four yearly trips to train the ECAF's staff in river forecasting using the SSARR model exclusively. At least six Canadian provincial offices had the SSARR installed for use in river forecasting. Again the English/Metric capability was very useful.

The People

David "Dave" Bauman, hydrologist, PDX River District Supervisor, Flash Flood Hydrologist, Deputy HIC. Dave came to PDX RFC as a junior meteorologist at the Olympia Weather Station. He worked with the RFC staff until 1959 when Elmer Fisher retired and he was promoted to Portland River District Supervisor and still under the RFC administration. He became the first PDX RFC Flash Flood Hydrologist in the early 1970's and served as Deputy HIC for a year or so before retirement in 1981. Dave is still alive and pretty good for the shape he's in. In his own words here are profiles of the people Dave worked with. These profiles are followed by several stories about past events.

Anthony (Tony) J. Polos, Portland RFC HIC from inception of RFC until his retirement in 1973. Tony passed away in 1980. Tony was a close friend of John McAllister in Ft. Worth and there were always fun times of reminiscing when John visited the PDX RFC. Tony was of Greek ancestry, his birth family was in the candy making business and had survived the 1906 San Francisco earthquake,

and he loved to tell stories of his early years growing up in that environment. Tony's wife Cookie loved Arabian horses so they had a small acreage in Aloha, OR about fifteen miles west of downtown Portland where they raised horses. One personal experience I had with Tony, outside office hours, was tearing down a rather large 1920's era auto garage located on an entire city block estate owned by Don Kuehl's Lutheran church. Our motivation was, Tony was building a horse barn and I was doing some house remodeling. Every evening after work for over a month we would each drive to this eastside property and starting with the roof, torn off shingles, spaced sheeting boards, studs, siding and wooden flooring, windows, doors and the whole ball of wax. We had a stack of building supplies you wouldn't believe. Then for several weeks we hauled, on trailers, through rush hour traffic, the divided materials to our respective homes. There was still a very large pile of shingles and reject wood, which the church wanted removed, so we had a huge bonfire one evening. No fire permit required, as I remember, in those days. It was hard physical work, but I think we both felt satisfied with our accomplishment. Tony completed his horse barn and I remodeled the back porch of our first home. The RFC offices were on the third floor and we and the whole building always knew when Tony came through the front door of the building as his booming voice echoed throughout the Custom House hallways. Tony's forecast responsibility in wintertime was the Santiam River at Jefferson, OR. Many times he had a crest forecast in mind, based on the amount of water flowing in the ditch in front of his home, before he looked at the current river and precipitation data and manually computed a forecast. It was amazing how many times he hit the crest on the nose based on his 'seat of the pants' method. Tony was a good boss; a strong supporter of his staff and everybody loved him including me!

More about **Tony Polos** (information provided by his son John): Tony graduated from University of California-Berkley in Civil Engineering, about 1935. Tony worked with Max Kohler, in his early years. Max was a well know hydrologist, having authored books on the subject, with Linsley & Paulhus. Several hydrology textbooks were authored jointly by Linsley, Kohler & Paulhus. In his early years with U.S. Weather Bureau (1930's) Tony worked with John McCallister. They were on a field trip in a government car. The windows were fogging up, so they put a candle on the front dash, The heat from the candle cracked the windshield! That was a hard one to explain. We moved to Portland in December 1949. We traveled across country by train. My brother and I learned how to open the pneumatic train doors and terrorized everyone for 2 1/2 days. My brother and I used to go visit my dad's office, circa 1950's. We were fascinated by all the mechanical calculators that would whirr for a minute or so, doing calculations. All the desks were laminated oak, as were the tall cabinets. Stored in them were stacks of large tablets, with routing forms printed on them. They used to do the streamflow routing by hand. Chuck Patterson stayed in the Navy Reserve, working in meteorology. Hydrologist Chuck Orwig and myself both joined the Navy and Navy Reserve. All three of us used to fly up together, to Seattle, to Sand Point Naval Air Station, for reserve weekends. This

was in the early and mid 1960's. During the major flood of 1964, some of the forecast predictions came from output of the SSARR program, written by Dave Rockwood of the U.S. Corps of Engineers. There were weekly briefings, put on by Tony, Dave Rockwood and Mark Nelson, also of the Corps Reservoir Control Section. My dad looked at the output of SSARR, (Stream flow Syntheses and Reservoir Regulation (computer program)). He did not like the peak, and arbitrarily increased it. The new forecast hit within a few tenths of the actual peak. Then Oregon Gov. Mark Hatfield, presented my dad an award for forecasting so closely. Tony retired about 1973, age 66, with 37 years service. When my folks moved to Vernonia, they built a house on Rock Creek, a major tributary of the Nehalem River. My dad checked the flood plain of the stream, and picked a site for the house. To date, floods have gotten up to the foundation but never in the house.

Vail P. Schermerhorn, Portland RFC, Deputy HIC. Vail was a quiet, introspective person and extremely professional and efficient in managing and directing the development of the necessary manual startup river and water supply forecasting procedures for the newly formed Portland RFC in the early 1950's. Vail was also a strong leader in the development of the first computerized river forecasting system in the country. Under the inspiration of David M. Rockwood, COE Hydrologist and Ed Davis programmer for IBM the now famous Streamflow Synthesis and Reservoir Regulation (SSARR) Model was born and became operational in 1962. The COE gave this computer model to the RFC for daily Columbia River and coastal stream forecasting operations and supplied the mainframe computer support and staff. It was an exciting time to be on the cutting edge of river forecasting technology. The SSARR framework program has survived the evolution of many hardware changes and is still being used on personal home computers today. After Tony's retirement in 1973, Vail became the HIC and served until his retirement

Donald W. Kuehl, hydrologist, Deputy HIC and HIC. Don was born in Milwaukee, WI and received meteorologist training during WWII at the University of Chicago and a civil engineering degree from New York University following the war. Don represented the RFC as technical liaison with interagency groups and was lead forecaster for water supply and daily river forecast operations. One of my favorite recollections was Don's self-described role as 'little wine maker' for his church's communion wine needs. He made wine from any fruit given to him in abundance. One year I had a huge fig crop and he made fig wine and it turned out pretty good. Don became HIC after Vail's retirement until his own retirement.

Robert Hullinger, HydroTech. Bob grew up in Montana in the days when his father and he cut ice from a lake on their property and shipped it east in insulated train cars. Bob was the 'early bird' person in the office each morning collecting and extracting river, temperature and precipitation data from teletype reports and plotting the data on area maps. When reading off reports to other staff members

for plotting Bob had his own pronunciation technique such as: Owyhee Reservoir was 'Hawaii', Kalispell was 'Cattle Smell' and Walla Walla was 'Walla squared'. There were others now forgotten. He made life interesting. One thing about Bob that fascinated me was his love of eating. His wife Frances was an excellent cook and prepared his early rise breakfast and his sack lunch. His lunchtime was 11:30 AM and about 11:00 AM he would usually say, 'I wonder what Frances has packed in my lunch?' After eating and enjoying whatever she had provided he would immediately say, 'I wonder what Frances will have for dinner tonight?'. Bob had good retirement but died several years ago.

Terri Foster, meteorologist. Terri was a tireless calculator operator in correlating water year precipitation with water year runoff but transferred in the middle 50's to another RFC.

Keith Butson, Climatologist/Statistician. Keith had WWII experience, university training and work experience in Ashville, NC Climatic Center before coming to PDX RFC. Keith's expertise kept development of river and water supply forecast procedures on track in optimizing correlation coefficients. Keith passed away from diabetes and other complications several years ago.

John (Jack) Capell Jack went on to be meteorologist with BPA and finally a TV meteorologist with NBC channel 8 in Portland until his retirement

Lynn Willoughby, hydrologist. Lynn had worked for the Irving P. Krick organization in southeastern USA and Mexico before joining the RFC staff. He too was a tireless worker at whatever task was assigned to him. Long hours and weekend shifts were taken in stride during winter rainy periods or spring/summer snowmelt season. Lynn retired but succumbed a year or two later.

Charles 'Pat' Patterson, meteorologist/hydrologist. Pat became the 'weather briefer' for the daily joint COE/WS/BPA operations briefing. His analysis in conjunction with NWS guidance zeroed in on weather's affect on the daily reservoir/electric power generation operation and scheduling. Pat retired and now lives near family in the Puget Sound area.

Bertha Johnston, secretary. Bertha had the task of keeping the boss and eight to ten staff happy with time keeping, letter and report typing and all of the usual tasks dumped on the secretary in any office. She was always upbeat but sometime in the late 1960's returned with her husband Lew to Dillsboro, OH. She retired but we have lost touch with her if she is surviving.

More Stories

A Christmas to remember On the 19th of December 1964, the Clackamas County Park Superintendent, Dick Wilmot called Dave Bauman at his home about midnight to tell him that temperatures in the foothills of the Cascade

Mountains had warmed rapidly, there was heavy rain falling, the snowpack at lower elevations was melting fast and headwater streams were already running bankfull. That began a six day vigil that ended with the third highest crest stage on the Willamette River at Portland (FS 18) of 29.8 feet on Christmas Day. On December 24th, with the crest nearing, most of the staff stayed on duty for 24 to 30 hours straight. About noon of Christmas Day it appeared the crest had occurred on the Willamette at Portland but the Columbia River at Vancouver, WA telemark gage was no longer reading out data. It was determined that the six-volt battery had failed from the almost constant number of calls in the past six days of the emergency. Where to buy a six-volt battery with screw terminals on Christmas Day? Dave remembered a friend who worked for the telephone company in Vancouver. A quick call confirmed they had a spare battery. Dave, ready to head home anyway, stopped and picked up the battery, then walked the bridge pier access walkway, installed the battery and the Vancouver Leupold Stevens Telemark gage was back in operation.

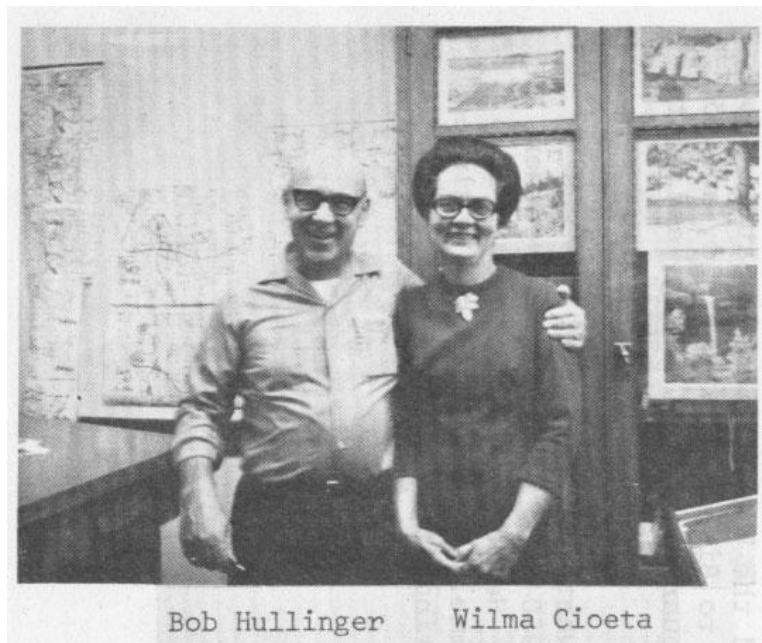
River gage vandalism 1960's style In the late 1940's when the city of Portland and Multnomah county were designing a new Morrison Street bridge over the Willamette River, Elmer Fisher, Portland River District Supervisor was successful in having a stilling well installed in the left bank (west bank) bridge pier for the placement of a Leupold Stevens step stage recorder sensor with float. The gage was installed on a shelf over the stilling well in a concrete small room with a steel vented door. The gage house was accessible from the seawall by a steel grated walkway. The sensor was connected by leased telephone line to the step stage recorder located in the Portland River District office. It was a wonderful tool to monitor the twice-daily tidal fluctuations in the Portland harbor. Sometime in the mid 1960's the early shift person, Bob Hullinger, noted the recorder was flat lining at the same stage when he came to work. Dave Bauman went to the river site and found the door vent had been removed and the gage sensor dropped down the stilling well. Apparently a 'wino' had thought there might be something of value in the little locked gage house, kicked in the rusted vent, slithered inside and in frustration tossed the sensor down the stilling well. Dave hired a diver from Vancouver to retrieve the sensor from the river bottom, sent it to Leupold Stevens for refurbishing and sometime later it was back doing its faithful job of sending river height signals. That particular instrument was manufactured in 1945 and it may still be functioning. Leupold Stevens always made great river recording equipment.

Foreign Visitors Beginning in 1958, when Hung Hsi Liu, Hydrologist from Formosa was sent by his government to study river-forecasting methods at PDX RFC, there have been many nationals assigned to visit for various lengths of time. It is remembered that HIC Tony had difficulty pronouncing Hung His Liu's name, so nick named him 'Henry'. There were visitors from Greece, Iceland, Turkey (2), Romania, Pakistan, The Philippines, and Brazil that come to mind.

Hold that crest! In the spring of 1972 the snowpack was well above average in most parts of the Columbia Basin and near record in some areas, so above runoff was forecast. Fortunately, there was heavy runoff during March so predictions of the reservoir regulated crest flow past Vancouver was forecast to be between 21 and 23 feet at that gaging point. That forecast would translate to about a foot less on the Willamette River in the Portland harbor due to the backwater effect. In the Portland harbor there were several milling companies that had lower docks that flooded a few inches over the 18 foot flood stage. Centennial Flouring Mills removed all that equipment and stock off that lower dock level but left everything in place on the next higher dock level as the spring runoff continued. Toward the end of May the 30-day flow projections a natural peak flow that would produce a 26-foot crest at Vancouver but with COE reservoir regulation a truncated broad crest of 23 feet for about two and a half weeks was possible. That's the way it turned out. It was incredible to see the river just inches below the upper dock at the Centennial Mills day after day and the stored sacks of product stacked there without getting wet. It was a victory for a favorable runoff regime and good reservoir regulation management by the COE.

The 1970s¹

David J. Bauman began his Weather Service career at the Olympia WSO in 1948, then transferred to Portland RFC in 1951. He has been Portland River District Supervisor since 1960, and is newly appointed Flash-Flood Hydrologist. Dave enjoys winter (mountain) and summer (beach) outdoor activities in the great Northwest, photography, and travel.

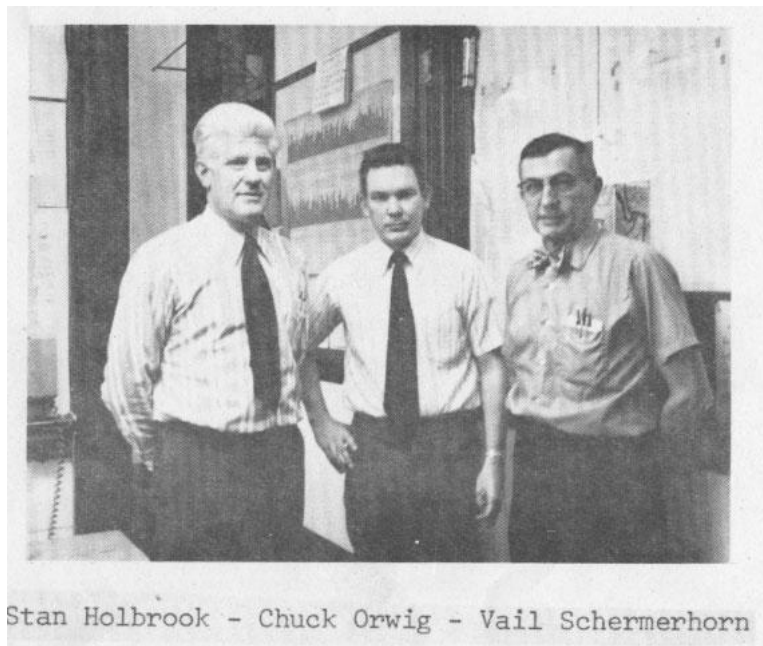


¹ Photos and profiles from early 1970s Western Region Headquarters publication (title and date of publication unknown)

Don Jensen began his weather career at Portland RFC after obtaining a meteorology degree at the University of Utah in 1972. His interests include “everything”.

Wilma Cioeta (secretary) transferred to the RFC from the Post Office Department in May 1961. Her hobbies include needlecraft and sewing; and in the summer she and her husband enjoy traveling and camping with their travel trailer.

Robert “Bob” Hullinger began working for the Weather Service at the Upper Columbia Snow Lab located in Summit, Montana in February 1947. He transferred to Portland RFC in October 1950. Hobbies include gardening and duck hunting.



Vail Schermerhorn (HIC) entered the Weather Service in Ellensburg, Washington, in 1950, and served at Seattle and the Kansas City RFC before transferring to the newly established Portland RFC in 1950. He would like to play a little more golf and do a little more tinkering with electronics in his workshop.

“Chuck” Orwig entered the Weather Service as a student trainee at Spokane in 1961. After graduation from the University of Washington in 1965, he went to Great Falls, and transferred to Portland RFC. Chuck enjoys gardening and family-related activities.

Stanley “Stan” G. Holbrook entered the Weather Bureau at Yakima, Washington, in the spring of 1951, moving in turn to Stevenson, Washington; and Glasgow, Montana. He served in the Army 1953054 and was stationed at the Port Monmouth, NJ, Meteorological Lab and at a Ballistics Meteorology Unit in

Korea. Subsequent NWS assignments include: Portland SCO; NCC, Asheville, ND; and SCOs at Oklahoma City, Boise, and Portland. Stan came to Portland RFC in June 1973 when the State Climatology program was curtailed. His other interests include camping, photography, hiking, and woodworking.



Pat Patterson, an ex-Navy Chief, joined the Weather Service at Glasgow, Montana, in 1947, transferring I turn to Bishop, Bakersfield, and to the Portland RFC in 1960. He enjoys square-dancing, hiking, and photography.

Lynn Willoughby in a former Air Force weather forecaster. He was employed by Dr. Irving P. Krick from 1950-55. He began his Weather Service career at Great Falls in 1955. He moved to Portland in 1956 and has worked in the RFC since that time. Lynn's interests include woodworking, stained glass, bottle-cutting, tennis, and good food.

Donald "Don" Kuehl (PA) entered the Weather Bureau in 1948 in the Hydrologic program at the old Seattle Regional Office after an Air Force tour in Europe. He transferred to the newly formed RFC in 1950 and has "resisted" all efforts at transfer. Off-duty activities include photography, church work, woodworking, and amateur investing.